

Claims

1. Solid composition which can decompose with the generation of hydrogen according to a self-sustaining combustion reaction after initiation of this reaction by an appropriate heat source, characterized in that the said composition comprises an alkali metal borohydride or alkaline earth metal borohydride and strontium nitrate $\text{Sr}(\text{NO}_3)_2$.
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- 10 2. Solid composition according to Claim 1, characterized in that it is provided in the form of a compact material.
- 15 3. Solid composition according to Claim 2, characterized in that the compact material is a pellet or a grain.
- 20 4. Solid composition according to Claim 1, characterized in that it is devoid of organic matter.
- 25 5. Solid composition according to Claim 1, characterized in that it is composed essentially of alkali metal borohydride or alkaline earth metal borohydride and of strontium nitrate $\text{Sr}(\text{NO}_3)_2$.
- 30 6. Solid composition according to Claim 1, characterized in that the sum of the contents by weight of alkali metal borohydride or alkaline earth metal borohydride and of strontium nitrate $\text{Sr}(\text{NO}_3)_2$ is greater than or equal to 90% with respect to the total weight of the composition.
- 35 7. Solid composition according to Claim 1, characterized in that the alkali metal borohydride is chosen from the group consisting of lithium borohydride, sodium borohydride and their mixtures.
8. Solid composition according to Claim 1,

characterized in that the alkaline earth metal borohydride is magnesium borohydride.

9. Solid composition according to Claim 1,
5 characterized in that the ratio of content by weight of alkali metal borohydride or alkaline earth metal borohydride to content by weight of strontium nitrate $\text{Sr}(\text{NO}_3)_2$ is between 1 and 10.

10 10. Process for the generation of hydrogen by self-sustaining combustion of a solid composition comprising an alkali metal borohydride or alkaline earth metal borohydride and strontium nitrate $\text{Sr}(\text{NO}_3)_2$, characterized in that:

- 15 - a pulverulent or granular homogeneous solid composition comprising an alkali metal borohydride or alkaline earth metal borohydride and strontium nitrate $\text{Sr}(\text{NO}_3)_2$ is prepared,
- this composition is subsequently agglomerated using appropriate means, so as to form a compact material,
- 20 - the compact material is placed in a combustion chamber,
- the combustion of the compact material is initiated using an appropriate heat source, which brings about the self-sustaining combustion of the material with generation of hydrogen up to the end of the combustion.

25 11. Hydrogen generator intended to supply hydrogen to a proton exchange membrane fuel cell, characterized in that this generator is a pyrotechnic generator comprising a solid composition according to Claim 1.

30 12. Proton exchange membrane fuel cell using hydrogen as fuel, comprising at least one electrochemical cell (1) and one hydrogen generator connected to the anode compartment of the cell (1), characterized in that this hydrogen generator is a pyrotechnic generator according to Claim 11.